# CFSW-51MHL

## 5 by 1 HDMI/MHL Fast Switcher

# Operation Manual

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## SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

## REVISION HISTORY

| VERSION NO. | DATE DD/MM/YY | SUMMARY OF CHANGE |
|---|---|---|
| RDV1 | 01/04/11 | Preliminary Release |
| VS1 | 25/01/13 | Updated format/diagrams |

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## 1. INTRODUCTION

The 5 by 1 HDMI/MHL Fast Switcher has MHL (Mobile High-Definition Link) interface integrated on its fifth input which can be used to share high definition video and audio from any of your MHL-ready mobile devices on an HDTV, and simultaneously charge the device whilst connected. The switcher supports 3D signal up to 2.25Gbps bandwidth, 12-bit Deep Color, Hi-Def lossless audio and other features defined by HDMI specifications, on all of its 5 input. Source selection can be easily controlled through on-panel buttons, IR remote control or by RS-232 protocol.

## 2. APPLICATIONS

- Smart home entertainment
- Show room or meeting room
- Smart AV installation
- Mobile device integration

## 3. PACKAGE CONTENTS

- 1× 5 by 1 HDMI/MHL Fast Switcher
- 1×5V DC Power Adaptor
- 1×IR Extender Cable
- 1×MHL to HDMI Cable
- 1×Remote Control with Battery (CR-113)
- Operation Manual

## 4. SYSTEM REQUIREMENTS

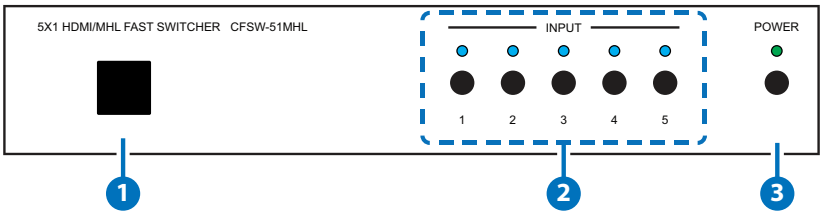
- HDMI sources such as PS3 or Blu-ray players for ports 1 to 5 using standard HDMI cabling. The fifth port can be connected to a MHL-ready mobile device with a MHL to HDMI cable.
- HDMI equipped display.

## 5. FEATURES

- Supports InstaPort Technology™
- Supports five HDMI input ports, the fifth port is an HDMI/MHL port
- Supports one HDMI output
- Supports video resolutions up to 1080p@60 Hz
- Supports HDMI specification features, including data rates up to 2.25Gbps and12-bit Deep Color
- Supports 3D signal
- MHL port supports 1080p@30 Hz or 1080i@60 Hz resolutions
- MHL port supports charging of a connected mobile device

# 6. OPERATION CONTROLS AND FUNCTIONS

## 6.1 Front Panel




**1 IR Receiver**

Supports reception of IR codes from the system's IR remote control only.

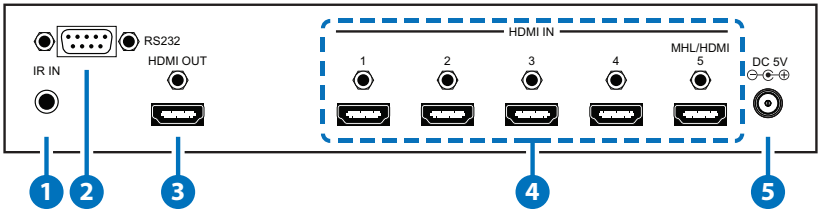
**2 INPUT**

Press the 'INPUT' source button to select the required input source, the blue LED will indicate the selected source.

**3 POWER**

Press this button to switch the device 'ON' or press it again to put it into standby mode. When the system is on the green LED will illuminate.

## 6.2 Rear Panel




**1 IR IN**

Connect to the supplied IR extender cable for receiving the IR remote signal for this device only.

**2 RS232**

Connect to a PC or control system with D-Sub 9-pin cable for RS-232 control. For RS-232 commands please refer to section 6.4.

**3 HDMI OUT**

Connect to LCD TV or HD monitor with an HDMI cable.

**4 HDMI IN**

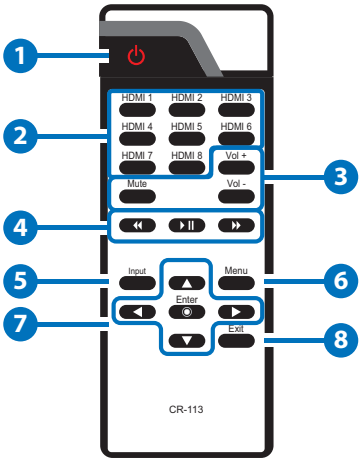
Connect HDMI sources to the HDMI inputs 1 to 5 such as DVD players, Blu-ray players, PS3s or other sources with HDMI cables. The fifth input can be used to connect to HDMI or MHL-Ready mobile devices.

*Note: When a MHL device is connected to the fifth MHL-ready input it will be charged automatically. If the MHL device is switched off when connected, it will be turned on automatically.*

**5 DC 5V**

Connect the DC 5V power supply into the system and plug the adaptor to an AC wall outlet.

## 6.3 Remote Control




**1 Power**

Press this button to switch the device on or to put the device into standby mode.

**2 HDMI 1~5**

HDMI Input selection keys. Press a key to directly select that input.

*Note: For this model only keys 1~5 are active.*

**3 Mute/Vol +/Vol -**

These buttons control the volume level or mutes the audio from the MHL mobile device connected to MHL input port.

**4 ◀◀ ▶II ▶▶**

These buttons can control what is playing on the MHL input source (including DVD or PS3 or Blu-ray or MHL mobile device), play/pause and track skip forward/backwards.

*Note: In order to control the MHL mobile device, the screen time-out setting must be set to 'OFF'.*

**5 Input**

Press this button to cycle through the input selections (from 1~5).

**6 Menu**

Press this button to enter the input source's root menu (including DVD or PS3 or Blu-ray or MHL device.

**7 ▲▼◀▶◉ & Enter**

These buttons will control the input source's OSD menu selection.

*Note: For the system to control functions 3~6, the input source device must comply with the following:*

*1. HDMI control (CEC/Via Link…etc) must be active**

*2. Must be able to accept CEC commands**

*Please refer to the manual for the source device for compatibility

**8 Exit**

Press this button to exit the selection.

## 6.4 RS-232 Protocol

**Pin Assignment**

| CFSW-51MHL | | | REMOTE CONTROL | |
|---|---|---|---|---|
| **Pin** | **Assignment** | | **Pin** | **Assignment** |
| 1 | NC | | 1 | NC |
| 2 | TxD | | 2 | RxD |
| 3 | RxD | ▶ | 3 | TxD |
| 4 | NC | ◀ | 4 | NC |
| 5 | GND | | 5 | GND |
| 6 | NC | | 6 | NC |
| 7 | NC | | 7 | NC |
| 8 | NC | | 8 | NC |
| 9 | NC | | 9 | NC |

Baud Rate: 19200 bps
Data Bit: 8-bit
Parity: None
Flow Control: None
Stop Bit: 1-bit

**RS-232 Commands**

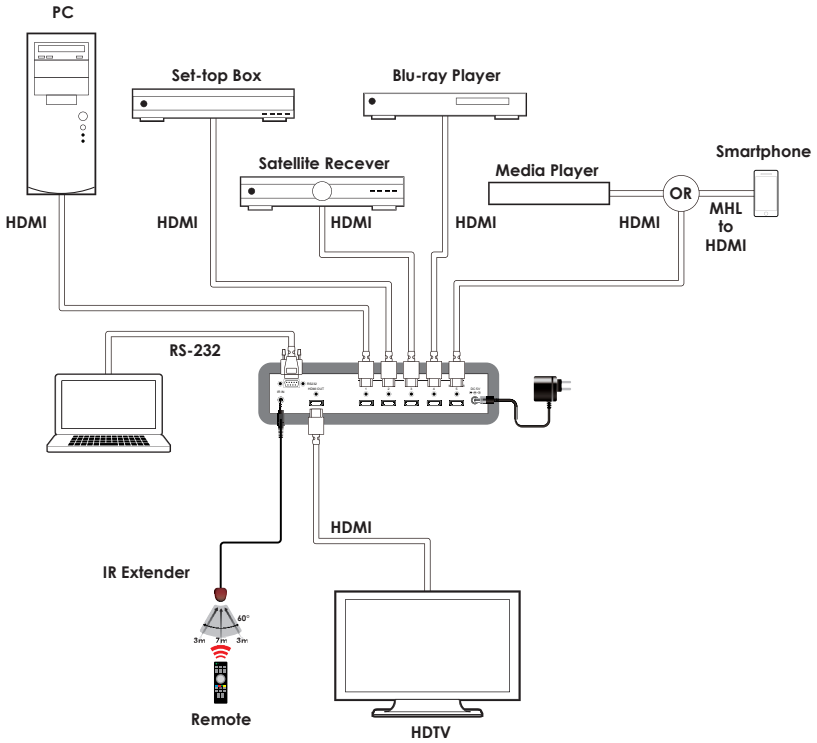
| COMMAND | ACTION |
|---|---|
| **POWER 00** | Power Off (standby) |
| **POWER 01** | Power On |
| **PORT 01** | Output Select Input 1 |
| **PORT 02** | Output Select Input 2 |
| **PORT 03** | Output Select Input 3 |
| **PORT 04** | Output Select Input 4 |
| **PORT 05** | Output Select Input 5 |
| **AUTO 00** | AUTO switch off |
| **AUTO 01** | AUTO switch on |
| **ISP 01** | Software ISP process |
| **RCP 00-7f** | RCP (remote command protocol) command |

*Note: The RS-232 commands will not be accepted unless followed with a carriage return.*

## 6.5 Remote Command Protocol

| Opcode | Key Name | Opcode | Key Name | Opcode | Key Name |
|---|---|---|---|---|---|
| 0x00 | Select | 0x2B | Enter | 0x4D-0x4F | Reserved |
| 0x01 | Up | 0x2C | Clear | 0x50 | Angle |
| 0x02 | Down | 0x2D-02xF | Reserved | 0x51 | Subpicture |
| 0x03 | Left | 0x30 | Channel Up | 0x52-0x5F | Reserved |
| 0x04 | Right | 0x31 | Channel Down | 0x60 | Play Function |
| 0x05 | Right-Up | 0x32 | Previous Channel | 0x61 | Pause_Play Func. |
| 0x06 | Right-Down | 0x33 | Sound Select | 0x62 | Record Function |
| 0x07 | Left-Up | 0x34 | Input Select | 0x63 | Pause_ Record Func. |
| 0x08 | Left-Down | 0x35 | Show Info | 0x64 | Stop Function |
| 0x09 | Root Menu | 0x36 | Help | 0x65 | Mute Function |
| 0x0A | Setup Menu | 0x37 | Page Up | 0x66 | Restore_ Volume Func. |
| 0x0B | Contents Menu | 0x38 | Page Down | 0x67 | Tune Function |
| 0x0C | Favorite Menu | 0x39-0x3F | Reserved | 0x68 | Select_Media Func. |
| 0x0D | Exit | 0x40 | Reserved | 0x69 | Reserved |
| 0x0E-0x1F | Reserved | 0x41 | Volume Up | 0x6A | Reserved |
| 0x20 | Numeric 0 | 0x42 | Volume Down | 0x6B-0x70 | Reserved |
| 0x21 | Numeric 1 | 0x43 | Mute | 0x71 | F1 |
| 0x22 | Numeric 2 | 0x44 | Play | 0x72 | F2 |
| 0x23 | Numeric 3 | 0x45 | Stop | 0x73 | F3 |
| 0x24 | Numeric 4 | 0x46 | Pause | 0x74 | F4 |
| 0x25 | Numeric 5 | 0x47 | Record | 0x75 | F5 |
| 0x26 | Numeric 6 | 0x48 | Rewind | 0x76-0x7D | Reserved |
| 0x27 | Numeric 7 | 0x49 | Fast Forward | 0x7E | Vendor_ |
| 0x28 | Numeric 8 | 0x4A | Eject | | Specific |
| 0x29 | Numeric 9 | 0x4B | Forward | 0x7F | Reserved |
| 0x2A | Dot | 0x4C | Backward | | |

# 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

| | |
|---|---|
| **Video Bandwidth** | 225 MHz/6.75 Gbps |
| **Input Ports** | 5×HDMI |
| **Output Port** | 1×HDMI |
| **Resolution Support** | VGA~WUXGA@60 (RB)<br>480i/p, 576i/p, 720p@50/60/120, 1080i@50/60, 1080p@24/30/50/60<br>(MHL only supports 1080p@30 & 1080i@60) |
| **ESD Protection** | Human body model:<br>±8 kV (air-gap discharge)<br>±4 kV (contact discharge) |
| **Power Supply** | 5 V/2.6 A DC (US/EU standards, CE/FCC/UL certified) |
| **Dimensions** | 240 mm (W)×110 mm (D)×49 mm (H) |
| **Weight** | 792 g |
| **Chassis Material** | Metal |
| **Silkscreen Color** | Black |
| **Operating Temperature** | 0 ˚C~40 ˚C/32 ˚F~104 ˚F |
| **Storage Temperature** | −20 ˚C~60 ˚C/−4 ˚F~140 ˚F |
| **Relative Humidity** | 20~90% RH (No Condensation) |
| **Power Consumption** | 3 W |

## 9. ACRONYMS

| ACRONYM | COMPLETE TERM |
|---|---|
| **MHL** | Mobile High-Definition Link |

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